

I. Simplify the following. Show work.

1. $(3x + 4)^2$
2. $(8x - 1)(5x + 4)$
3. $4(x + 2)(3x + 4)$
4. $5x(x - 3)$
5. $(5x - 9)^2$
6. $2(x + 8)^2$
7. $(10x - 4)(x + 3)$
8. $(11x + 4)^2$

II. Factor the following. Show your work.

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|-----------------------|----------------------|
| 9. $x^2 + 6x + 9$ | 10. $x^2 - 14x + 49$ |
| 11. $x^2 + 2x + 1$ | 12. $x^2 + 10x + 25$ |
| 13. $x^2 - 121$ | 14. $x^2 - 169$ |
| 15. $x^2 - 18x + 81$ | 16. $x^2 + 14x + 45$ |
| 17. $x^2 + 6x + 5$ | 18. $x^2 - 9x + 8$ |
| 19. $x^2 - 14x - 120$ | 20. $x^2 - 8x - 84$ |
| 21. $4x - 20x^2$ | 22. $10x^2 + 40x$ |
| 23. $-2x + 26x^2$ | 24. $-18x^2 - 36x$ |

III. For each of the following quadratic equations, find the following (NO CALCULATOR)

- a. y - intercept _____
- b. vertex point (show work!!) _____
- c. equation of the line of symmetry _____
- d. sketch the graph of the quadratic equation based on part a, b, c

i. $x^2 - 10x - 56$

ii. $3x^2 - 24x - 10$

iii. $-7x^2 - 28x + 10$